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ABSTRACT

The effects of institutional types and their structural and compositional characteristics on students entering two- or four-year academic programs were examined, with a focus on students' educational attainment. Data were obtained from the National Longitudinal Study of the High School Class of 1972. Individual student variables were considered, including: four measures of socioeconomic status, race, sex, gender, religion, three measures of academic preparation, educational and occupational plans, and parental aspiration for the student. Four variables dealt with individual level of involvement with the student role and other potentially competitive roles. Academic performance, faculty contact, and level of satisfaction with the college were also assessed. Institutional variables included type of college (private/public universities, four-year colleges, and two-year colleges); college selectivity level; percent of low income students; percent of minorities in the freshman class; college size; number of majors offered; percent of part-time students; percent of vocational majors offered; percent of graduate/professional students; student costs; and expenditures per student. In general, more academically selective, smaller, less vocationally oriented colleges with high levels of structural integration have positive effects on student attainment, as do colleges with larger proportions of low income and minority students. Statistical tables and a list of references are provided. (SW)

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The Effects of College Type and Characteristics on Educational Attainment*

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ABSTRACT

This study makes use of a longitudinal survey of students who were high school seniors in 1972 (The National Longitudinal Study of the High School Class of 1972), including only those who entered an academic program in a two- or four-year college by Fall, 1974. Individual survey data information were merged with data on the institutions of higher education attended by students in their first year. Analyses examined the effects of the nature of the college/university attended on educational attainment and goals -- net of relevant individual predictors (such as social status, academic preparation, and early goal levels). Two sets of college/university variables are utilized. The first is a set of categories based on control (private/public), and level (university, four-year college, two-year college). The second includes measures of more specific dimensions of institutions, including ability, socio-economic status, gender and ethnic composition; percent of students who are at the graduate level; percent of major areas that are vocational (i.e., not liberal arts/sciences); percent of students who live on-campus and who are not full-time students; size of enrollment (graduate and undergraduate combined); expenditures (general and educational) per student; and tuition/fees cost per year. The analyses control for the effects of individual work, residence, full versus part-time attendance, and marital status during the first years of college. A set of factors that might account for any effects of higher education characteristics is also included. It includes measures of early academic performance in college, contact with faculty members, and general feelings of satisfaction with college life. The analyses indicate that institutions do vary widely in educational outcomes (and to a lesser extent occupational outcomes), but that much of this between-institution variation can be traced to differences in the students who enter varying kinds of colleges, and to their greater or lesser involvement with the student role during the early years of college. However, some significant effects of institutions do exist, net of individual selection/recruitment/involvement factors. In general, more academically selective, smaller, less vocationally oriented colleges, with high levels of structural integration have positive effects on student attainment. In addition, colleges with larger proportions of low SES and minority students (which seem to be private four-year colleges) have generally positive effects, partly through more lenient grading standards which encourage persistence of students. Expenditures per se (a frequently used measure of "quality" of colleges) did not have overall positive effects on student attainment. Two-year colleges, as has been noted in a number of other studies, had the most negative effects on student educational attainment.

Introduction

One of the major developments in U.S. postsecondary education during the last two decades has been the increasing number and diversity of institutions. A corresponding increase in both the proportion of secondary school graduates continuing to college and the diversity of students is also evident: more lower and middle SES, minority, female, and older students, and more who work, commute to campus, are married, and are enrolled only part-time. However, a number of studies confirm that the simple expansion of higher education is quite consistent with little or no change in rates of social mobility for students (Mare, 1981; Bowles, 1972), if students are allocated to different forms of higher education and if this affects progress in the educational "contest" and occupational attainment. This study examines the effects of institutional types and their structural and compositional characteristics on a sample of students who entered college in the early 1970's.

Review of Literature

Studies of college effects indicate that about half of the total association of college variables with student attainments can be attributed to differences between students selected/recruited into different kinds of colleges (Astin and Panos, 1969; Kamens, 1971; Wegner and Sewell, 1970; Alwin, 1976). Despite controls for these factors, most studies have found small remaining effects of college characteristics on rates of attrition and graduation (Folger et al., 1970; Astin, 1975,1977) ,the likelihood of education beyond the bachelor's degree (Spaeth, 1968; Alexander and Eckland, 1977), and occupational status and earnings (Solmon and Wachtel, 1975; Sewell and Hauser, 1975; Spaeth, 1970).

Assessing the consequences of diversity in higher educational institutions requires, of course, the specification of the dimensions that "make a difference". The two most common approaches involve: (1) typologies of conventional institutional types, and (2) structural/compositional factors.

Institutional typologies. Most typologies are based on combinations of control, highest degree, and curricular offerings (Astin and Panos, 1969; Wegner and Sewell, 1970; Alwin, 1974; Carnegie Commission on Higher Education, 1974).

This approach is valuable in some ways. First, students probably do select colleges by fundamental distinctions such as control, curriculum, and degree structure. Second,these institutional types vary simultaneously on many organizational characteristics. Third, these types do have significant effects on student outcomes. Higher persistence and graduation rates and status attainments are associated with a liberal arts curriculum (Astin and Panos, 1969; Alwin, 1974; Solmon and Wachtel, 1975), private control (Astin and Panos, 1969; Alwin, 1974; Thomas, 1981; Trent and Medsker, 1968), four-year versus two-year level (Anderson, 1981; Folger, Astin and Bayer, 1970; Astin, 1971), and higher status university versus "comprehensive" four-year state college or general liberal arts college structure (Solmon and Wachtel, 1975; Wegner and Sewell, 1970).

Structural/compositional variables. Many studies have established that students in more selective institutions,controlling individual ability, receive lower grades, but are higher in persistence, graduation, entry to graduate school, and achievement goals. Another commonly examined factor is one generally termed "quality". While it is sometimes used interchangeably with selectivity, most researchers use "quality" to refer to quantity or nature of certain educational resources. Indicators have included percent of faculty with doctoral degrees, income or expenditures per student, library books per student, faculty-student ratios, research grant income, and faculty

salaries. Results have been inconsistent, but some studies have found small positive effects of quality (or affluence) on educational and occupational outcomes (Kamens, 1967; Kamens, 1971; Astin, 1962; Astin and Panos, 1969; Wegner, 1967; Rock, Centra and Linn, 1970;Solmon ,1973 ; Alwin, 1974). While a number of other organizational features have been cited as theoretically important, few other variables have received adequate attention in research. The effects of size have been examined in a number of studies,but results are not consistent. Astin and Panos (1969) and Rock, Centra and Linn (1970) generally find size to be inversely associated with socio-economic attainments (though Rock, Centra and Linn note that only where income per student is high are is small size an advantage. However, Kamens (1971) and Thomas (1981) report no such advantage for small colleges. Astin (1977) found negative effects of size on cultural knowledge, student-faculty relations, student satisfaction (in most areas), and involvement in college life and extracurricular activities.

A related factor is that of cohesion of the faculty/peer environment. Astin and Panos (1969) and Astin (1977) report positive effects of cohesion on persistence, while Solmon (1973) reports positive effects of faculty/student ratios. Astin and Panos (1969) also report that colleges with high rates of student employment (perhaps an indicator of low cohesion) have lower persistence and attainment. Solmon (1973) also found positive effects of income of students, or socioeconomic composition.

Theoretical perspectives on college effects.

Kamens (1971) suggests that institutions which are believed to produce special leadership or corporate elites (such as prestigious universities, or wealthy liberal arts schools), are more likely to maintain certain organizational features which may actually affect student attainment. These features include: selection rituals at entry and early in the college career; residentiality; small size and low complexity (at the undergraduate level); a focus on a broad, common liberal arts curriculum, with low vocationalism and specialization; single sex composition; and rural, isolated location.

Socio-economic composition, as an indicator of the typical occupational destination and origin of students, has also been discussed in conflict theory descriptions of the educational system. High SES institutions are described as institutions designed to ensure higher SES students both educational success and entry to elite occupations, while institutions for lower SES students are designed to fail large numbers of students, and track them into less prestigious, lower paying occupational slots (Karabel, 1972; Bowles and Gintis, 1976; Collins, 1971).

Feldman notes the importance of examining such social organization dimensions as control, status, goals, bureaucracy/complexity, density and cohesiveness. Astin (1962) also focuses on size and curricular variety, homogeneity (percent of students concentrated in a few major fields), and a "realistic"/technical emphasis rather than intellectual orientation, as well as general affluence in resources.

From the empirical studies and theoretical statements, a number of potentially important structural and compositional dimensions emerge rather consistently:

1. predominant orientation of institutions
2. ability composition/selectivity
3. SES (and ethnic) composition
4. size and diversity or "bureaucratization"
5. cohesiveness/integration

In addition, basic institutional typologies seem important as a set of

socially meaningful categories that vary on all of the above dimensions. These can be seen as a set of causally prior variables whose effects may be explained by specific structural/compositional variables.

A Causal Model of College Effects.

Despite advances in samples and analyses, a number of common flaws in research on college effects can be found. First, studies frequently exclude non-graduates. This clearly ignores the importance of differential attrition rates between colleges. Second, many studies use the last college attended rather than the first. While both can provide useful information, studying last college only ignores effects of first colleges attended on students careers, and may lead to confusion in causal ordering. Third, many studies have excluded students who attended graduate/professional schools (Alwin, 1974). This can lead to a lack of attention to the effects of undergraduate colleges on decisions to get further education, and to underestimation of college effects on occupational status. Fourth, most studies have excluded two-year colleges, even though they are a rapidly expanding part of our educational system.

Finally, studies have been characterized by a lack of theoretical development. Studies tend to either use a single measure assumed to correspond to "quality", or use a large number of indicators of unspecified dimensions of colleges. A number of studies using the latter strategy then use stepwise regression, allowing a computer program to pick the "important" college variables. Researchers have generally failed to specify why certain dimensions might be important theoretically, or how these dimensions might come to affect students. There has also been a lack of attention to intermediate processes and outcomes through which colleges affect attainments of students. Finally, models tend to exclude other young adult experiences which might be correlated both with educational experiences and status attainments. This seems primarily a holdover from days when college students were more "traditional" and less involved in social worlds other than those of the campus. It seems important now to consider such factors as work involvement, marriage and off-campus residence.

This study includes controls for socio-economic background, race, religion, gender, ability, high school achievement and curriculum, early educational goals, and parental aspirations, in order to separate selection/recruitment differences and true college effects. Second, it separates college effects from simple between-college differences in student experiences (such as residence on or off-campus, marital status, employment, and part- or full-time student status). While these individual experiences may be in part structured by colleges, they cannot in and of themselves be called "college effects". Finally, the study specifies some intervening processes in college effects, focusing on academic performance, contact with faculty and satisfaction with college as intervening variables in the causal model. It is hypothesized that more selective institutions, with higher socio-economic composition, oriented toward preparation for graduate work and professional careers will tend to directly increase students' academic attainment, (though they may also lower relative academic performance). Small colleges, low in bureaucratization, high in integration, will tend to increase students' relative academic performance, faculty contact and overall satisfaction, and thus lead to higher educational attainment. Large, diverse, bureaucratically organized colleges will tend to lower student performance, satisfaction, faculty contact, and thus educational attainment.

The basic causal model proposed is shown in Figure 1.

Figure 1 About Here

Methods

Sample

This study uses a subset of the National Longitudinal Study of the High School Class of 1972 . Only entrants to two- or four-year colleges, in academic curricula (see Eckland et al, 1979 for operationalization), by the Fall of 1974 are included. In addition, only respondents to both the base-year and first follow-up surveys are utilized. The resulting maximum number of cases for analysis is 7376. Response rates for the follow-ups have been quite high, and are probably higher for college attenders than other groups (see Levinsohn et al, 1978 for description of follow-up procedures and specific response rates).

Measurement of Individual Student Variables

Background variables. Socio-economic status is measured by four separate indicators: father's education (FAED), mother's education (MOED), father's occupational prestige score on the Duncan SEI scale (FOCC), and family income (INC). Race is represented by a dummy variable (BLACK), with blacks scored as 2 and whites as 1. Gender is a dummy variable (MALE), with males 2 and females 1. Religion is represented by two dummy variables (chosen by preliminary analyses): Jewish (JEW), and Catholic (CATH), with the omitted comparison groups including Protestant, other Christian, other and none. Three measures of academic preparation are used. Ability (ABIL) is the standardized sum of scores on the reading, letter groups, math, and vocabulary subtests given with the base-year questionnaire. High school program (HSPGM) is a dummy variable contrasting non-college (2) with college preparatory (1). High school achievement (HSGPA) is a measure of average high school grades from school records. Educational plans (EDEXP) refers to the level of education the student expected to attain. Occupational aspirations (OCASP) are measured by the Duncan SEI score for the occupation the student wanted to enter. A measure of academic self concept (ACSC), refers to the student's confidence in ability to do well in college. Finally, a measure of parental aspirations (PASP),constructed by averaging student reports of the level of education desired by mother and father was used.

A final control variable is necessary because of the inclusion of both immediate (1972) and delayed (1973,1974)entrants. While some studies have shown that determinants of educational performance and attainment are similar for the two groups (especially when the delay is only one or two years), it is necessary to control for the main effects of delayed entry on outcomes. Delayed entrants were included in order to increase the number of minority and lower SES students represented. The variable is a dichotomy (DELAY) of whether the student enter late (1),or immediately after high school(0).

Post-high school role involvements. Four factors dealing with individual level of involvement with the student role and other potentially competitive roles are included as controls in a second stage. Marital status (MS) is a dichotomy for currently married or not at the time of entry to college. Hours of employment(HRS) is the number of hours per week worked in October of the year of college entry. Residence on-campus or off-campus (CAMPUS) is also a dichotomy. It refers to residence at the time of the first follow-up for immediate or 1973 entrants and to residence at the time of the second follow-up for 1974 entrants. Thus it may not correspond precisely to residence at the time of college entry. In fact, for the small proportion of students who entered in 1972 but had dropped out of college entirely by 1973, it is a biased indicator, since they could not have been still living on-campus in 1973. For that subgroup then, the indicator of residence includes a small component due to lack of persistence to the second year

Because of this, its effects may be overstated. However, exclusion of the residence variable from equations does not generally alter conclusions about college effects or effects of other college role involvement or experience variables. An indicator is also used of whether the student claimed to be a full-time (2) or part-time (1) student (FTPT).

Intervening college experience variables. Three measures of the experiences of students in the college setting are included. College academic performance (GPA) refers to average grades in the first year of college Faculty contact is a dichotomy of whether the students report they know a faculty member well enough to ask for a letter of reference or recommendation (FAC). Overall level of satisfaction with college experiences (CSAT), is determined by average ratings of several aspects of the college and one's life there, on a one to five scale.

Educational Outcomes. The primary concern of this research is with effects of college experiences on traditional educational attainment. It does not look at vocational education, or other nontraditional training. Preliminary analyses indicated a pattern of increasing magnitude of the effects of initial college on persistence from the second to the fourth year and to overall educational attainment and rates of graduation. Rather than examine each individual year of persistence, this paper examines summary measures of attainment. The first measure used is attainment of a bachelor's degree (BA) by 1979 (seven years after high school). In addition, a summary measure of the number of years of college completed by 1979 (EDATT) is analyzed. The final measure of educational attainment refers to whether the student had entered a graduate or professional program at the post-baccalaureate level (GRAD) by 1979. A measure of academic educational goals (ED79) is also analyzed. It measures the level of college education the respondent expected to complete, and it is taken from the 1979 questionnaire. Through this one can see if long term plans for education are as greatly affected as early attainment levels.

College Variables

The following measures were used in analyses:

1. A set of dummy variables for private university (PRUNV), private four-year college (PRCOL), private two-year college (PRTWO), public university (PUBUNV), and public four-year college (PUBCOL) compared to public community colleges (PUBTWO) as the omitted comparison group was used. Four-year colleges are those offering at least four-years of post-high school work, granting baccalaureate or equivalent degrees. Universities are those with considerable emphasis on graduate instruction, with at least two professional schools not exclusively technological in character. Two-year schools are those offering only associate degrees, certificates, and diplomas, below the baccalaureate level. Public includes institutions under federal, state, or local control. Private includes both religious-affiliated and other private colleges.
2. Selectivity - mean SAT score of freshmen class (SAT).
3. Percent of students with family income less than 6,000 (LSES).
4. percent of freshmen class of minority group. If missing, and categorized as one of 105 "traditionally black" institutions, value was set equal to 100%.
5. Total opening fall enrollment, undergraduate and graduate, with missing data estimated from a composite size indicator from Carroll (1979) (SIZE).

6. Number of major areas offered (NMAJ).
7. Percent of all students enrolled part-time Constructed using Tripartite data on numbers of full-time and part-time undergraduates and graduate students. Missing data estimated using a decile score for the percent of half-time students from Carroll(1979).
8. percent of all majors offered in vocational areas, with vocational defined as any area other than liberal arts and natural sciences/mathematics. This includes areas like business, engineering, education, trades, and other applied programs (PVOC).
9. percent of all students at graduate/professional level (PGRAD).
10. Combined tuition /fees cost-undergraduate (TTN).
11. Educational/general expenditures per student (EXP).

Exploratory factor analyses of this set (and of larger sets in earlier stages), using principal components analysis with orthogonal rotation, indicated the existence of four factors. The first has a positive loading for percent living on campus, and negative loadings from vocational majors and percent part-time. This could be termed an "integration" factor. The second has positive loadings for size, number and diversity of major areas, corresponding to a theoretical factor of bureaucratization and complexity. The third factor has high positive loadings for percent graduate students, expenditures, cost, and average SAT. This sounds closest to what is generally termed "quality". The fourth factor has a lower positive loading for average SAT scores, and negative loadings for the percent of low-income students, and percent minority group students. It thus corresponds best to a general socio-economic compositon factor.

Findings

Table 1 shows the matrix of correlations between the selected college characteristics, using the student as the unit of analysis. Note that the most frequently studied dimension — ability composition — is measured by average SAT scores. The matrix indicates that colleges high in ability composition also tend to have higher educational expenditures, higher tuition/fees rates, fewer lower SES, minority, and half-time students, more graduate students, are larger in size and diversity of major areas (but with proportionately fewer vocational majors. Yet this does not necessarily mean that the desirable strategy for analysis is to use a scale of "quality" or to use SAT level alone.

Table 1 About Here

Table 2 indicates the variation in college organization and composition by basic institutional type. From this, it is clear that college types vary substantially in almost all of the characteristics. The patterns are quite similar across variables. Private institutions are generally higher in "quality", as defined by resources, cost, composition, and integration, compared to similar public institutions. The same is true of universities compared to four-year colleges. Two-year colleges, especially public controlled, are generally lowest on all quality factors. The major exceptions to these patterns involve size and diversity of major areas. The largest and most diverse institutions are the public colleges and universities.

Table 2 About Here

Analyses not shown here clearly indicate the need to control for variations between different types of colleges in the social and academic background of entering students. In multiple regression analyses, student background accounted for from 4% to 21% of the variation in college

characteristics. In this sample, parental education seems to be more important than father's occupation or family income in the college selection process. In general, higher SES students enter colleges with higher expenditures and costs, higher SES and ability composition, fewer minority students and fewer part-time students. They also enter colleges which are larger, with more diverse majors (but fewer in vocational areas), and more graduate students. Black students enter colleges higher in cost and expenditures (privately controlled), with fewer half-time students, fewer vocational majors, but with lower SES and ability composition. Religion has some minor effects on college selection, with both Catholic and Jewish students entering larger colleges, with higher selectivity and resources. Few gender effects on college selection are seen in this sample, though males do enter colleges with higher expenditures and more graduate students. Ability and academic preparation have strong effects. Students with high ability and high school achievement, from college preparatory programs enter colleges which have higher resources, larger size, fewer part-time students, less vocational and more graduate education orientations, and higher SES and ability composition. Goals for education and occupation, academic self concept, and parental aspirations have only modest effects, but in expected directions. Finally, delayed entrants tend to enter colleges with lower costs, more part-time students, more vocationally oriented, and less selective.

In Table 3, the relationships of college type and characteristics with marital status, hours of employment, place of residence, and full versus part-time school attendance are shown. For college type, the figures given are once again the dummy variable unstandardized regression coefficients, with public community colleges as the omitted group. The figures for college characteristics are standardized bivariate correlations. These results indicate that three of the four indicators of student integration into the student versus other roles are substantially correlated with type of college entered. Marital status does not vary significantly between colleges. Residence on-campus is least likely at two year colleges and most likely at private universities and four-year colleges. Campus residence is also higher where expenditures and costs are higher, where greater diversity in majors exists, where academic ability is higher, where there are more graduate students, and where most students are white, higher SES, full-time, and in academic curricula.

Employment, conversely, is highest at two-year colleges, and lowest at universities--both public and private--, followed by four-year schools. Students work more at colleges with high proportions of lower SES and minority students, more half-time students, and more vocational orientations. Students work fewer hours at schools with higher resources, greater diversity in majors, with graduate programs and high selectivity.

Students are more likely to be full-time at four-year colleges and universities than two-year schools. Naturally, this variable is also inversely correlated with institutional proportions of half-time students. In addition, colleges with higher resources and costs, more major areas but fewer vocational areas, more graduate students, and higher selectivity also have more full-time students.

Thus it is necessary to control for these factors when assessing college effects. While colleges may, through policies for student admission or retention, try to limit student employment, residence, and part-time status, on the whole these are now individual decisions, and represent to a substantial degree the level of individual commitment to the student role.

Thus this research argues that these variables should be treated as an additional set of correlated control variables, rather than as intervening variables through which colleges affect students. However, so that one can examine the effects of colleges, including the component due to these factors, equations are presented which represent "total" college effects with these and other factors not controlled.

Table 3 About Here

While residence, marital status, employment, and part-time status are treated simply as correlates of college characteristics, the next set of variables represents intervening variables in the causal model. These include college academic performance, amount of contact with faculty, and psychological integration into the college. Table 4 shows the effects of four sets of post-high school predictors on these variables. The first column for each dependent variable actually represents the results of two separate regression equations. The coefficients for PRUNV to PBCOL -- the college type dummy variables (again in unstandardized form), represent the total effects of college type, controlling for student background. That is, the equation included only background variables and the college type variables. The coefficients in the same column for college characteristics represent the effects of <u>these</u> variables controlling only for background. The college type variables were not included in the equations producing these results. The explained variance for the college type and background equation is shown below the column, with that for college characteristics and background below it in parentheses. Standardized coefficients are presented for college characteristics. The second equation for each dependent variable added <u>both</u> college type and college characteristics simultaneously, again with background controlled. The third equation adds in the student role involvement variables. This format is followed in all of the remaining tables.

From Table 4 we see that students receive lower grades if they enter four-year or higher institutions, especially public universities. The disadvantage of public university and college students cannot be attributed to differences in role involvement. In addition, where there are more low SES and minority students, and in larger schools, grades of students are relatively higher. Once again, this cannot be explained by student role involvement. The only role involvement factor which does affect grades is student status. Full-time students receive lower grades than part-timers.

Contact with faculty is higher at all private colleges than public ones, and is lowest at public universities. Faculty contact is also lower at large schools, with more half-time and graduate students. The effect of half-time student composition can be attributed to differences in individual role involvement. No contextual effects beyond this are seen. However, role involvement, as expected does affect faculty contact. Students who are enrolled full-time, even controlling for residence and employment, are more likely to feel they know a faculty member well, as are students living on campus. coefficient for hours of employment is negative, though not significant.

The general level of psychological integration (or satisfaction) is higher at two-year private colleges and other private institutions than at those under public control. The only significant characteristics of colleges are their proportions of half-time and graduate students, each of which is negatively related to satisfaction. Once again, however, the effect of half-time composition can be attributed to student role involvement and in particular to its effects on student residence. Campus residents are

significantly more satisfied with college experiences.

Table 4 About Here

Table 5 shows the primary results of the study, including the structural and reduced form equations for the effects of college type, college characteristics, role involvement, and college experiences on educational attainment and achievement goals. As before the first column actually represents two equations- the net (of background) effects of college type, and the net effects of college characteristics, each set entered excluding the other. The second column is the equation including both college sets, the third adds the role involvement variables, the fourth college experiences. Unstandardized coefficients are given for college type and standardized for all others.

Attainment of bachelor's degree. All four-year or higher colleges are superior to two-year colleges in degree attainment. Private colleges are also superior to public institutions, within each level. These college type effects decline with the addition of college characteristics, though two-year colleges remain lower than all others. Considering college characteristics alone, degree completion is higher at colleges with lower expenditures, small in size, but with predominantly full-time students, a diverse curriculum structure with a more academic than vocational orientation, with higher ability students. The effects of all of these but diversity of curricula and ability composition remain significant controlling for role involvement.

There are substantial advantages for students who live on-campus, who enroll full-time, and who do not work or work only a few hours a week. Performance and faculty contact are positive in their effects, (and their effects are greater than for early persistence outcomes). Performance is particularly important , with an effect twice as strong as faculty contact. Level of satisfaction is a less important, but still significant positive factor in degree completion.

Educational attainment. Again there is a clear pattern of differentiation in outcomes by college type, controlling for a variety of student selection/recruitment factors. Private institutions have positive effects compared to public schools. The most advantageous settings are the private universities, and the most disadvantageous are the public community colleges. However, controlling for the set of college characteristics, public colleges actually have an advantage over similar private schools. The initial positive effect of going to a private institution is due to differences in the composition and organization of these institutions. Of the college characteristics, the following are associated with increased levels of educational attainment: larger proportions of low SES students, smaller size, fewer half-time students, and fewer vocational majors. However, most of these effects can be attributed to differences in student role involvement. Only having a lower SES compositon and greater integration (fewer half-time students) remain significant positive factors in attainment. As with other aspects of educational attainment, students who enroll full-time, who live on-campus, and who have lower employment levels have higher attainments by 1979. High academic performance, contact with faculty, and college satisfaction also increase attainment. Other analyses also show that the effect of academic performance is stronger for longer term attainment than for persistence in the first two years. Its effect seems to appear later in the college career. The effect is also greater than that for degree completion, and is three times as strong as that of faculty contact and satisfaction level.

Graduate school attendance. Among this group of college entrants, the

nature of the first college attended has little impact on later entry to graduate level programs. Thus either the specific decision to enter a graduate program is one based more on individual background, or it is affected by later college experiences more than early ones. It is also likely that stronger effects would be seen if the population were limited to college graduates. However, at this point, our interest is primarily in the long term effects of early enrollment decisions. Further work is planned to explore effects of last college attended and the issue of greater effects for graduates than entrants.

The results do show some advantage of private over public institutions, and a continuing disadvantage of two-year college entry compared to all other college types. Among the remaining post-high school variables, there are significant effects. Students who work more hours while in schools and who live off-campus are less likely to enter graduate school in later years. These effects remain significant even controlling for differences in performance and integration into the college. In addition,a positive effect of full-time attendance emerges in the final equation. Finally, as predicted, students with higher performance, greater faculty contact, and greater satisfaction are more likely to get some graduate education.

Achievement goals. Educational goals are most affected by basic college type. The strongest pattern among these types is the clear disadvantage for entrants to two-year colleges, and the clear advantage of entrants to private universities. Two specific aspects of colleges have some impact as well. Colleges high in costs, and those with a more academic than vocational atmosphere (as in private universities) encourage higher educational plans several years after entry. The advantage of private university entrants continues despite controls for college characteristics, role involvement, and college experiences. Students who are full-time and live on-campus, those with high grades, and faculty contact, are again superior in later educational plans. The effects of grades and residence are particularly strong.

Table 5 About Here

Conclusions

First, this study does point out the importance of further work on the dimensionality of college characteristics and the specification of critical dimensions for different student groups and student outcomes. It suggests that "quality" alone is simply not an adequate indicator of all the important aspects of institutions of higher education. At a minimum, there are separate dimensions of "quality", social/ethnic composition, integration and size/complexity. Selectivity in admissions may also be distinct from general quality of resources, and it may be important to consider the undergraduate/graduate focus and academic/vocational focus as discrete factors.

While many researchers have examined multiple college dimensions, such research has had a psychological bias, in which organizational and compositional factors are seen as reducible to the primary variable of interpersonal influence. While this may be appropriate for some research questions, it is also appropriate to examine the broader organizational and compositional factors themselves. First, these factors are more immediately amenable to change through manipulation of policies. Second, they allow us to begin to make use of existing theories on organizations and organizational effects from a sociological perspective. What sociologists have learned about other kinds of complex organizations should be used to better understand

colleges and universities.

Do colleges affect students?. In the early post-high school years, colleges seem to primarily affect outcomes associated directly with schooling. Results not reported here indicate that labor force outcomes are not as dependent on college characteristics or experiences, though they are affected by educational attainment.

A separate summary of the effects of each college characteristic should aid in the isolation of areas deserving further research.

Selectivity. In analyses not shown here, the basic model was repeated using only selectivity and socio-economic composition. These analyses indicated that selectivity did not lower grades, but that low SES composition did have a significant positive effect on grades. Nor did selectivity increase contact with faculty, college satisfaction, or early persistence in college in those analyses. Both high ability and low SES composition had positive effects on degree completion, attainment and achievement goals. Thus these two correlated college variables do not work in comparable ways to the processes found at the secondary level (Alexander and Eckland, 1977). Traditional stepwise regression procedures, allowing college characteristics to enter after background controls, were also used. For none of the educational outcomes did selectivity enter the equation (part-time students, number of major areas, vocational majors, SES composition, students living on-campus, expenditures and costs entered for various outcomes). Thus while selectivity has positive correlations with outcomes, it is not the most influential aspect of the college context. It is important indirectly because of its effects on employment, residence, and full-time student. Clearly we need more work on specifying what it is about more selective colleges that is causally important.

Socio-economic composition. As noted above, SES composition seems more influential than ability composition. While it has a negative zero-order corelation with educational attainment, when background of students is controlled, it has positive effects on grades, degree completion and overall attainment. However, students at low SES schools also work more and are more likely to be part-time, commuter students. Overall, low SES colleges do not "cool out" their students. It is interesting to note that despite positive effects on educational outcomes, low SES composition lowers a variety of occupational outcomes. Thus the students may not be gaining much in occupational/economic status for their degrees.

Minority composition. As with SES composition, the percent of minority students at the college has negative zero-order correlations with outcomes and is associated with higher employment, lower full-time status and campus residence. However, it has positive effects on grades, though not on degree completion or attainment (though it does have positive effects on early persistence in college).

Expenditures. Again, zero-order correlations are opposite to net effects. Despite positive associations with outcomes, students in schools with high expenditures get lower grades and are less likely to persist and earn degrees. However, such students are more likely to be high in student role involvement. In part, the negative effects of expenditures may reflect patterns traditionally associated with selectivity. Schools with greater resources also seem to "weed out" more students, as do those with higher SES populations.

Tuition and fees cost. This variable reflects the basic private/public distinction, as well as that of degree level. Zero-order correlations with outcomes are all positive, students at higher cost schools work less, study

full-time, live on-campus, get higher grades and contact with faculty and end up with higher educational goals. Howevr, these effects are seen only when the college typology is omitted. Thus it is not paying more that aids students, but something more general about private colleges with higher costs. Percent of part-time students. This appears to be an important characteristic of colleges. This study uses it as an indicator of structural integration or cohesion of the institution. It may also be related to a student culture low on commitment to academics. London (1978) argues that the community college culture is permeated by an anti-intellectual atmosphere, in which commitment to school is devalued. Regardless of whether it is a structural or cultural effect, the part-time context is harmful to students. Both zero-order and net effects are negative. The sole positive effect is on grades, but this is accompanied by lower faculty contact and dissatisfaction. The effect of context is seen even controlling for individual part-time attendance, employment, and residence for degree completion. Thus the context both affects individual decisions about commitment to the student role, and affects all students regardless of their decisions.

Size of college. Again, zero-order correlations are deceptive. On the surface it appears that large colleges are beneficial, when size actually has signficant negative effects on degree completion and attainment. This is despite the lower employment and higher grades of those in larger colleges. Part of the negative effect is attributable to lower faculty contact.

Diversity of major areas. More "comprehensive" colleges, apart from their greater size, seem to encourage higher rates of degree completion and overall attainment, despite somewhat lower student grades and satisfaction. Some of the effects can be attributed to lower student employment and higgher proportions of full-time, on-campus students. It appears that such colleges may initially be "tougher" for students, but that they are able to seek out majors in which they eventually succeed.

Vocational orientations. Remember that this is a structural feature, dealing with the availability of majors other than the once-traditional liberal arts and sciences. Colleges which are more vocational in this sense are also characteristics by higher numbers of part-time, commuter, working students. However, students at such colleges are given higher grades and get more contact with faculty. Despite the greater leniency in grading, such colleges have negative total effects on attainment and goals. Graduate student proportions. While attending an institution with a large graduate contingent does not seem to lower or raise attainment levels, it does lower undergraduate contact with faculty and satisfaction. Thus it is indirectly a negative environment for undergraduates.

Basic college type. Two-year colleges show the classic "frog-pond" effect on grades. Controlling background, a student will receive the highest grades in two-year colleges, but have the lowest chance of graduation. The negative effects are not explained away by the lower role involvement of community college students. And, it is not just public institutions which show this pattern, but also private junior colleges. The differences in degree completion are also seen in long-term goals for attainment.

Private colleges and universities lead to higher grades, faculty contact, and student satsifaction. Private four-year schools, especially universities, are also characterized by lower employment and higher on-campus residence. Finally, they have positive effects on student degree completion, attainment, graduate school entry, and goal levels. On the whole, the benefits of being in a private school can be traced, however, to their specific characteristics - - less vocational, less part-time, smaller, higher ability composition. The

remainder can be traced to greater involvement, higher grades, and more positive experiences of private college entrants. When all of these factors are taken into account, there seems to be a reversal in which public university and college students have a small advantage in overall attainment. However, public four-year college and university entrants also receive the lowest grades, have the least contact with faculty and the lowest student satisfaction. In fact, these aspects of their experiences are even more negative than going to a community college.

The study makes it clear that degree of involvement with the student role versus other roles is of great importance. Students who are married, who work more hours, who enroll on a part-time basic, who commute to school, who have less contact with faculty on the campus, are less likely to persist in college and receive their degrees. These effects of role involvement are not due to lack of ability to perform adequately in college -- they exist controlling for college grades. Earlier, it was argued that to provide the most stringent test of college effects, one should control for involvement in competing roles versus the student role. However, it should be kept in mind that colleges can -- to a certain extent-- influence the combining of student and non-student roles. The analyses presented here show that colleges differ significantly in the role involvement of students. Thus one way for colleges to increase student persistence would seem to be compensating in some way for the low role involvement of many students.

Footnotes

1. These analyses utilize only the first college attended (which could be 1972, 1973, or 1974). Through a match-merging process, data on the first institution attended were added to the student record. Data on institutions were taken from two machine-readable sources, which themselves include data from American Council on Education surveys, HEGIS, HED and other federal databases. Wherever possible, missing data from one source was estimated using data from one of the other sources. The two machine-readable institutional files are Tenison (1976) -- prepared for the College Entrance Examination Board, and Carroll (1979) --characteristics of postsecondary education prepared for the Office of Education. The Tenison file includes matched data for institutions attended by 73% of those who claimed they were in postsecondary institutions in 1972 or 1973. The Tenison file includes primarily traditional colleges and universities. The Carroll file has wider coverage -- including all postsecondary institutions. However, since this analysis deals with students in academic programs, most of those institutions are inappropriate. In addition, many of these did not have F.I.C.E. codes, and thus could not have been merged with NLS data. Therefore, only the cases from the Carroll file that had F.I.C.E. codes were included for merging. This latter file contained 5975 institutions. The Tenison file included only 4139 institutions, a subset of the Carroll file. Data from the smaller file was added to institutions in the larger file, and attempts were made to derive measures of all desired variables. Measures were chosen based on theoretical relevance, extent of institutional coverage, and data quality. Where possible, missing data were estimated using similar measures from another source. Measures with too much overlap with other measures, measures with little variability, measures with obvious problems (such as many clearly out of range scores) were excluded in the preliminary stages of the research. Some composites were either already constructed in the data sources, or were created from similar indicators of concepts.

Table 1

Correlations, Means and Standard Deviations of College Characteristics

	EXP	TTN	LSES	MIN	HT	SIZE	NMAJ	PGRAD	PVOC	SAT
EXP	1.000									
TTN	.318	1.000								
LSES	-.171	-.323	1.000							
MIN	-.053	-.156	.508	1.000						
HT	-.319	-.366	.122	.135	1.000					
SIZE	.118	-.194	-.173	-.052	-.062	1.000				
NMAJ	.105	-.063	-.146	-.109	-.307	.639	1.000			
PGRAD	.378	.146	-.138	-.060	-.208	.246	.210	1.000		
PVOC	-.299	-.443	.238	.083	.413	-.121	-.220	-.289	1.000	
SAT	.487	.508	-.480	-.320	-.400	.322	.281	.344	-.515	1.000
S.D.	19.78	696	.121	18.79	.151	9240	18.19	.145	.177	121
MEAN	21.83	824	.195	18.75	.174	9987	39.34	.116	.520	955
N	6048	6372	5408	5604	6283	6372	6289	5503	6289	6305

Table 2

College Type Variation in Organization and Composition

	College Type						
	PRUNV	PRCOL	PRTWO	PBUNV	PBCOL	A	R2
EXP	22.89	14.92	4.66	11.98	11.76	12.45	.102
TTN	1884	1505	704	142	135	380	.723
LSES	-.097	-.059	.008*	-.037	.003	.217	.058
MIN	-6.29	-5.22	-5.17	-2.93	-1.29	21.17	.011
HT	-.283	-.260	-.186	-.244	-.225	.345	.113
SIZE	-2628	-1982	-2396	8399	6566	7167	.194
NMAJ	9.12	7.60	-4.85	21.51	23.73	27.78	.289
PVOC	-.343	-.296	-.081	-.286	-.189	.698	.438
PGRAD	.149	.072	.056	.126	.103	.079	.114
SAT	222	142	35	124	78	872	.256

*Not significant at .05 level

Table 3

Correlations of College Characteristics and Role Involvement

With Unstandardized Dummy Regression of College Type and Role Involvement

	MS	HRS	CAMPUS	FTPT
Unstandardized Coefficients				
PRUNV	-.085*	-8.214	.491	.120
PRCOL	-.078*	-7.046	.469	.119
PRTWO	-.058*	-2.622	.195	.043
PBUNV	-.027*	-7.056	.299	.114
PBCOL	.005*	-5.930	.339	.103
A	1.145	12.694	.089	1.853
R2	.000	.051	.125	.034
Bivariate Correlations				
EXP	-.011*	-.120	.218	.084
TTN	-.019*	-.136	.259	.099
LSES	.006*	.040	-.115	-.027*
MIN	-.008*	.048	-.118	-.029
HT	.002*	.267	-.383	-.283
SIZE	.004*	-.033	-.003*	.013*
NMAJ	.003*	-.131	.161	.099
PVOC	.018*	.174	-.257	-.136
PGRAD	-.003*	-.082	.126	.064
SAT	-.017*	-.183	.267	.113

* Not significant at the .05 level

Table 4

Net Effects of Colleges and Role Involvement on Academic Performance and Integration

	GPA			FAC			CSAT		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Unstandardized coefficients									
PRUNV	-.265*	-.110	-.113	.060*	.021	.013	.048	.063	.052
PRCOL	-.257*	-.138	-.135	.092*	.054*	.042	.039	.041	.025
PRTWO	.004	.045	.042	.089*	.061*	.060*	.103*	.090*	.087*
PBUNV	-.351*	-.232*	-.226*	-.047*	-.040	-.048*	-.037	-.047	-.055
PBCOL	-.238*	-.152	-.148*	-.013	-.018	-.029	-.021	-.030	-.042
Standardized Coefficients									
EXP	-.013	-.013	-.013	.006	.009	.005	.003	.006	.002
TTN	.042*	.026	.026	.056*	-.001	-.002	-.023	-.027	-.028
LSES	.042*	.042*	.043*	.008	.004	.002	.011	.008	.007
MIN	.031*	.034*	.034*	-.016	-.013	-.010	-.014	-.012	-.008
HT	.044*	.025	.018	-.046*	-.050*	-.025	-.037*	-.042*	-.026
SIZE	.034*	.035*	.033*	-.092*	-.090*	-.078	-.001	.001	.010
NMAJ	-.028*	-.013	-.012	.012	.023	.015	-.032*	-.027	-.020
PVOC	.052*	.024	.025	.029*	.014	.012	.014	-.000	-.001
PGRAD	-.006	-.002	-.002	-.031*	-.029*	-.029*	-.034*	-.034*	-.034*
SAT	-.024	-.019	-.020	-.011	-.002	-.007	.000	.006	.000
MS			.007			.003			.002
HRS			-.004			-.019			-.015
FTPT			-.054*			.047*			-.005
CAMPUS			.002			.070*			.069*
R2 Controls only	.183			.031			.031		
R2	.192	.198	.200	.041	.051	.057	.034	.036	.041
	(.196)			(.048)			(.035)		

* Significant at the .05 level

Table 5

Net Effects of Colleges, Role Involvement, and College Experiences on Educational Attainment of College Entrants

	BA				EDATT			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Unstandardized Coefficients								
PRUNV	.190*	.044	.023	.025	.301*	.077	.034	.040
PRCOL	.169*	.043	.010	.012	.231*	.081	.014	.019
PRTWO	-.101*	-.034	-.039	-.046	-.061	-.062	-.071	-.087
PBUNV	.134*	.041*	.023	.036	.225*	.100*	.058*	.089*
PBCOL	.140*	.056*	.029	.037*	.248*	.120*	.062	.082*
Standardized Coefficients								
EXP	-.023*	-.026*	-.035*	-.034*	-.005	-.007	-.017	-.016
TTN	.023	.026	.023	.021	.026	.035	.032	.030
LSES	.041*	.039*	.035*	.030*	.048*	.046*	.041*	.035*
MIN	-.018	-.020	-.011	-.014	-.011	-.013	-.004	-.008
HT	-.100*	-.088*	-.035*	-.034*	-.088*	-.075*	-.013	-.013
SIZE	-.037*	-.034*	-.006	-.006	-.029*	-.026	.004	.005
NMAJ	.045*	.027	.008	.009	.046*	.026	.005	.007
PVOC	-.051*	-.034*	-.037*	-.040*	-.033*	-.013	-.016	-.020
PGRAD	.005	.003	.003	.006	.003	-.000	.000	.004
SAT	.036*	.034*	.019	.022	.013	.011	-.006	-.003
MS			-.008	-.009			-.012	-.013
HRS			-.056*	-.054*			-.074*	-.071*
FTPT			.055*	.058*			.078*	.082*
CAMPUS			.174*	.167*			.183*	.175*
GPA				.104*				.131*
FAC				.052*				.063*
CSAT				.038*				.040*
R2 Controls only	.196					.230		
R2	.213 (.220)	.222*	.256*	.272*	.212 (.247)	.249	.293	.317

* Significant at the .05 level

Table 5 (Continued)

Net Effects of Colleges, Role Involvement, and College Experiences on Educational Attainment of College Entrants

	ED79				GRAD			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Unstandardized Coefficients								
PRUNV	.350*	.226*	.190*	.200*	.066	-.004	-.012	-.009
PRCOL	.273*	.165*	.111	.120	.072*	.018	.006	.009
PRTWO	.069	.030	.021	.002	.029	.004	.002	-.004
PBUNV	.171*	.033	.005	.043	.050*	.029	.023	.034
PBCOL	.199*	.078	.034	.059	.049*	.022	.022	.030
Standardized Coefficients								
EXP	.007	.008	.003	.004	.020	.019	.015	.016
TTN	.031*	-.002	-.004	-.006	.025	.039	.038	.035
LSES	.022	.019	.017	.012	.000	-.001	-.003	-.009
MIN	.008	.007	.012	.008	.008	.008	.011	.007
HT	-.025	-.020	.008	.007	-.019	-.008	.014	.014
SIZE	.002	.007	.022	.022	-.003	-.006	.006	.005
NMAJ	.024	.017	.007	.008	.008	-.000	-.008	-.007
PVOC	-.028*	-.023	-.025	-.028	-.022	-.011	-.012	-.015
PGRAD	-.003	-.005	-.005	-.003	.014	.013	.013	.016
SAT	.017	.018	.011	.014	.003	.004	-.002	.000
MS			.002	.001			-.014	-.015
HRS			-.018	-.017			-.029*	-.027*
FTPT			.028*	.032*			.023	.027*
CAMPUS			.100*	.095*			.068*	.063*
GPA				.116*				.121*
FAC				.055*				.049*
CSAT				.012				.026*
R2 Controls only		.154				.063		
R2	.159	.160	.171	.187	.066	.068	.074	.092
	(.160)				(.067)			

* Significant at the .05 level

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